Interdisciplinary problem solving workshops for grizzly bear conservation in Banff National Park, Canada

MURRAY B. RUTHERFORD[1], MICHAEL L. GIBEAU[2], SUSAN G. CLARK[3] &
EMILY C. CHAMBERLAIN[4]

[1,4]*School of Resource and Environmental Management, Simon Fraser University,
Burnaby, British Columbia, Canada V5A 1S6*
[2]*Parks Canada, Mountain National Parks, Box 213, Lake Louise, Alberta, Canada T0L
1E0*
[3]*School of Forestry and Environmental Studies, Institution for Social and Policy Studies,
Yale University, New Haven, CT 06511*

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Abstract. We used the policy sciences as an organizing framework for a series of workshops with stakeholders in Banff National Park on "Interdisciplinary problem solving for grizzly bear conservation and management." In recent years, bear conservation efforts in this region have been hindered by acrimonious disputes about the production and use of scientific knowledge in management. The workshops introduced the policy sciences as a means of thinking more effectively about problems, and encouraged participants to use this approach to develop innovative solutions to the problems of grizzly bear conservation. Each workshop addressed different aspects of the policy sciences framework: i) Standpoint Clarification; ii) Problem Orientation; iii) Social Process Mapping; and iv) Decision Process Mapping. In this article we discuss the design and outcomes of the workshops and assess their effectiveness in integrating knowledge to find common ground.

Introduction

Grizzly bear (*Ursus arctos*) conservation, like other applied conservation problems, can be highly contentious. The carefully designed plans of scientists and managers often become the focal points for intense struggles among participants with differing value demands, beliefs about what is happening and what will happen in the future, and preferred solutions to perceived problems (Mattson et al. 2006; Clark, Rutherford and Casey 2005). In order to develop and implement more successful conservation strategies, scientists, managers and other participants must be able to identify what the problems really are, assess what knowledge is needed and available, integrate knowledge from a variety of sources to develop a reliable understanding of the causal factors underlying problems, and generate effective solutions that are in the common interest. Adding to the challenge, participants must be cognizant of how their own standpoints influence their perceptions of problems and solutions, and be able to engage constructively in decision making processes.

These tasks are not trivial, but participants in conservation policy often have no formal training in interdisciplinary problem solving or in the use of a comprehensive system for integrating knowledge to address policy problems. They simply lack the skills and tools to be successful.

This article discusses a series of workshops held in Banff, Alberta, designed to help stakeholders involved with grizzly bear conservation in Banff National Park and the surrounding region to improve their problem solving skills. The workshops introduced participants to the interdisciplinary problem solving (IPS) framework of the policy sciences, and demonstrated how this framework can be used to understand the problems of grizzly bear conservation and develop more effective and acceptable solutions. Many of the stakeholders that took part in these IPS workshops continue to meet on an ongoing basis to address grizzly bear conservation problems in the region.

Our primary goal in holding these IPS workshops and similar workshops in other settings is to improve the capacity of participants to organize and take part in democratic decision making, in order to develop effective programs for conservation that will engage the public and benefit from public support (Mattson et al. 2006; Rutherford and Clark 2005; Clark, Begg and Lowe 2002). Unlike other articles in this collection, the comprehensive scope and analytical power of the policy sciences framework were used in this case to structure and conduct a collaborative decision-making process, rather than to analyze a conservation problem from the outside and develop external recommendations to inform decision making.

We begin the paper with a brief overview of the context for grizzly bear conservation in Banff National Park, and then discuss a preliminary Q-method study that we conducted with stakeholders to explore their perspectives on grizzly bear management. The Q study was followed by three IPS workshops, each focusing on different aspects of the policy sciences framework: i) Standpoint Clarification, in which participants scrutinized their own perspectives and potential biases; ii) Problem Orientation, where they learned to construct more comprehensive and useful problem definitions; iii) Social Process Mapping, where they identified and examined key variables in the context for bear conservation; and iv) Decision Process Mapping, where they evaluated the strengths and weaknesses of existing decision-making processes and recommended alternatives for improvement. We describe the design, implementation and outcomes of these IPS workshops, discuss their influence on the development of grizzly bear conservation policy in the region, and assess the contributions of the policy sciences framework to more rational and effective decision making in collaborative processes. We conclude the paper with additional lessons from our experiences.

The context: people and grizzly bears in Banff National Park

Banff National Park is one of the most renowned and frequently visited parks in Canada. It was the country's first national park and the third national park in the world (Parks Canada 2007). The park encompasses approximately 6,600 km^2 in the Rocky Mountains of southwestern Alberta and is part of a larger ecologically linked area of about 40,000 km^2 known as the Central Rockies Ecosystem (Parks Canada 2004; Gibeau 2000). A large portion of the Central Rockies Ecosystem, including Banff and other Canadian national parks, is recognized as a world heritage site (Parks Canada 2004).

Due to their extraordinary beauty and easy accessibility, Banff and the surrounding areas have become highly developed. The park is bisected by the Trans-Canada Highway (four lanes wide through much of the park) and a major transcontinental railway.

Approximately 4 million people visit Banff Park each year and another 4 million pass through (Parks Canada 2004). These visitors support a busy tourism sector in and around the park, including five golf courses, five ski areas, and numerous hotels, restaurants, book stores, clothing retailers, recreational suppliers, guides and outfitters. The hamlet of Lake Louise and the town of Banff, both situated in the park itself, have approximately 1500 and 7600 residents, respectively (Parks Canada 2004). The town of Canmore, which lies just outside the park's eastern gates, has a population of more than 11,500 (Town of Canmore 2007). The City of Calgary, approximately an hour's drive away, passed the 1,000,000 mark in 2007 (City of Calgary 2007). The corridor from Calgary to Canmore is the fastest growing area in the province of Alberta (Parks Canada 2004).

The Banff region also hosts a small population of grizzly bears. The number of grizzlies in the Central Rockies Ecosystem as a whole has been recently estimated at between 400-500 (Herrero, Miller and Seal 2000), with about 60 of these generally located in Banff National Park (Gibeau et al. 1996). This population is not closed, but the western boundary of the Central Rockies Ecosystem at the Columbia River Trench in British Columbia has substantial obstacles to bear movement, and the eastern boundary is the eastern extent of the range of grizzly bears in Alberta (Gibeau and Stevens 2005).

Although small in total number, the population of bears in the Central Rockies Ecosystem is particularly valuable ecologically and socially. Grizzly bears have been extirpated from much of their former range in Alberta, and the province's grizzly bear recovery team estimated in 2005 that there could be less than 700 remaining in the entire province (not including cubs dependent on their mothers) (Alberta Grizzly Bear Recovery Team 2005). Ongoing census work at the time of writing suggests this number may actually be as low as 400 bears left in all of Alberta (M. Gibeau pers. comm.), reduced from an estimated pre-European population of 6000 bears (Eastern Slopes Grizzly Bear Project 1998). The Alberta Endangered Species Conservation Committee recommended in 2002 that the province's grizzly bear population be designated as "Threatened" under the Alberta *Wildlife Act* (Alberta Grizzly Bear Recovery Team 2005), but this recommendation had not been adopted by the provincial government at the time of writing.

Given the very poor overall status of grizzlies in Alberta, all of the remaining bears in the province are important, but the grizzly bears in Banff National Park have added symbolic and political significance simply because they exist in one of Canada's premier national parks. Consider the park's Core Vision statement (Parks Canada 2004, s. 2.5.2):

> Banff National Park reveals the majesty and wildness of the Rocky Mountains. It is a symbol of Canada, a place of great beauty, where nature is able to flourish and evolve. People from around the world participate in the life of the park, finding inspiration, enjoyment, livelihoods and understanding. Through their wisdom and foresight in protecting this small part of the planet, Canadians demonstrate leadership in forging healthy relationships between people and nature. Banff National Park is, above all else, a place of wonder, where the richness of life is respected and celebrated.

Unfortunately, "forging healthy relationships" between people and grizzly bears in Banff National Park has been a difficult challenge. Given the pervasive human presence in the region, conflicts between bears and humans are inevitable. Much of the commercial and

residential development and recreational activity is in the lower-elevation valleys, which are also prime habitat for grizzly bears. Benn and Herrero (2005) found that 119 of 131 recorded grizzly bear mortalities in Banff National Park and the adjoining Yoho National Park in the period 1971-1998 were due to human-related causes, and that "all 95 human-caused mortalities with known accurate locations were within 500m of roads or 200m of trails" (p. 63). Intensive management and frequent interventions to move or protect individual bears have improved the survival rate for grizzlies in Banff National Park in recent years, but humans are still the primary cause of death (Garshelis, Gibeau and Herrero 2005a).

Conflicts between bears and humans in the Banff region have harmed people as well as bears. Recent high-profile incidents include the death in 2005 of a jogger who was mauled by a grizzly in Canmore, and the maulings of three hikers in separate incidents in Banff National Park in that same year. In 1995, a grizzly bear injured six people in one night in the Lake Louise campground. Efforts to reduce the number of conflicts and grizzly bear mortalities, and to advance other environmental objectives, have meant constraints on human activities and development in the park. Examples include caps on population growth for the hamlet of Lake Louise and the town of Banff, a fence around the Lake Louise campground to keep people and bears apart, and seasonal or permanent closures of hiking trails and recreational areas.

As in other settings where large carnivores and people compete for limited space, there is much controversy over the management of grizzlies in the Banff region. Some argue that efforts to protect the bears have been inadequate and that human development and other factors doom grizzlies in Banff to decline and eventual extinction. Others claim that human activities have been overly restricted and that the bear population is doing well. Grizzly bear biologists have been embroiled in these conflicts, accused of having a pro-conservation bias and of using research methods – particularly trapping and radio-collaring – that are perceived to be inhumane (Chamberlain and Rutherford 2005).

In short, grizzly bear management in Banff National Park has been highly politicized in recent years, with little trust, understanding, or meaningful direct communication among participants. Charged with the dual mandate of protecting ecological integrity and providing for human use (*Canada National Parks Act* 2000), Parks Canada has struggled to find common ground among the competing demands. In politicized environments like this, conflict can be exacerbated by traditional top-down approaches to wildlife management, in which an agency produces a management plan based on input from scientific elites and then consults stakeholders about the plan (Clark and Rutherford 2005). Such "scientific management" cannot provide satisfactory answers to complex socio-political problems involving high uncertainty and competing values (Brunner and Steelman 2005); and community members expect and are entitled to a greater role in decision making. The IPS workshops described here were conceived as an alternative approach that would develop the capacity of stakeholders and inform and involve them more directly.

The interdisciplinary problem solving workshops

We began the project in the summer of 2004 by conducting a preliminary Q-method study with stakeholders to explore their perspectives about grizzly bear management in the Banff region. Following this study, the three initial IPS workshops took place in May 2005, October 2005, and March 2006. In the first two workshops, participants examined and discussed their views about bears and bear management, worked through the tasks of problem orientation, and mapped the social context. The third workshop focused on the process of decision making itself. We scheduled the workshops at approximately 5 month intervals in order to allow participants time between workshops to read the material provided, reflect on what they had learned, and perhaps test the framework in practice before returning for the next session. Table 1, which was distributed to workshop participants, summarizes the goals and content of each of the three IPS workshops, and we describe the Q-method study and individual workshops in more detail below.

Table 1. Goals and Structure of the interdisciplinary problem solving workshops

	Workshop #1 (Standpoint Clarification)	Workshop #2 (Problem Orientation)	Workshop #3 (Decision Process)
Theme	Who we are and why we don't agree.	Exactly what is the problem?	What are we going to do about it?
Topics	- standpoint clarification - base values - social process mapping - identification of process needs	- problem orientation - revisiting the clustering and providing feedback on the work of workshop #1	- decision process identified and agreed upon
Goals	- more reflective participants - contextual participants	- clear problem definition - clear goals and alternatives - clearer process direction	- integration of knowledge - participants take responsibility for sustained collaborative process
Schedule	May 2005	Oct 2005	Feb 2006
Measures of success	- willing to attend next two workshops - begin to become comfortable with the process (at least to suspend disbelief) - understand some of the differences between this and the "usual" ways to engage stakeholders	- willing to agree to the defining of some particular group with the range of interests needed, as determined by the group, to continue and to identify the specific ground rules for that group	- sustained collaborative process with clear ground rules and a preliminary agenda of work
Structure (tools)	Two main activities, one content and one process oriented in nature a. identification of issues through a mind mapping activity (mind mapping is a formalized technique to ensure the widest range of thoughts about an issue are captured). From the breadth of information, clustering and organization of information takes place about the issue at hand and a decision can be made as to the scope of the issue. b. The second part of workshop #1 should be devoted to the process of engagement by the interests around the table – issues will be discussed that start to understand how this process is "different."	Two main activities, one content and one process oriented in nature a. confirmation of issues – small group discussions on the various aspects to ensure that enough conversation has taken place to be clear about which issues are on and off the table. b. small "tools" workshop on ground rules including the development of some preliminary ground rules for the sustained effort.	Two main activities: as before a. agreement on ground rules including composition of group, how it is going to work together, how decisions will be made, who leads it, how the group will function and how to leave if need be. b. work on preliminary agenda of work – work plan outline with some timelines associated with it.

Setting the stage for interdisciplinary problem solving: a Q-method study of perspectives

Approximately one year before the first IPS workshop, we conducted a Q-method study to explore the perspectives of those involved with or interested in grizzly bear conservation in the Banff region. Q methodology was originally developed by William Stephenson, a psychologist and physicist, as a means to investigate human subjectivity (Stephenson 1953; Brown 1980). In Q method, individuals map their perspectives about a subject by sorting cards on which are printed statements expressing a variety of different opinions. After the sorting is complete, the results are factor analyzed to identify groups of individuals that sorted the statements in similar ways, and to create a model of their views. The paper by Byrd in this issue provides a more detailed explanation and example of Q method, and Durning and Brown (2007) discuss Q method and decision making. Further information on Q can be found in Brown (1980) and McKeown and Thomas (1988).

Twenty-nine individuals participated in the present Q study, including staff of federal and provincial agencies, scientists, local business operators, staff of environmental organizations, local residents, industry representatives and others. We asked each participant to sort a set of statements about the problems of grizzly bear management in Banff National Park and the surrounding areas, and a second set of statements about possible solutions to those problems. The statements used in these Q sorts came from earlier interviews we conducted with many of the participants, and expressed a broad range of opinions about grizzly bear management problems and solutions in the Banff region (the methodology and results are described in more detail in Chamberlain (2006) and Chamberlain and Rutherford (2005)). Factor analysis revealed four distinct views (or subjective understandings) of the problems and three distinct views of preferred solutions. These views are summarized in Table 2. Following our analysis we provided a draft report to participants and held a joint meeting with them in September 2004 to share and discuss the preliminary results. Feedback from this meeting helped us to interpret the views and to prepare our final report (Chamberlain and Rutherford 2005), which we provided to all participants before the interdisciplinary problem solving workshops began.

Table 2. Summary of views from the Q study of perspectives on grizzly bear management in the Banff-Bow Valley region (see Chamberlain and Rutherford 2005)

Problems

View I   Very concerned about the status of grizzly bears in the region, and also concerned about the impacts of increasing human use on bears. Key problems include the lack of an overall conservation strategy, a visionary plan, and system-wide objectives. There will be more challenges in the future with bear activity in communities.

View II   The grizzly bear population and grizzly bear management are doing well, but achievements haven't been sufficiently recognized or celebrated. Problems have been over-emphasized, in part by interest groups with other objectives.

View III   The population status of bears is acceptable, achievements in management haven't been recognized, and interest groups tend to overemphasize the problems. But View III is also concerned about human activities and pressure, the lack of a well organized and visionary plan, and bear activity in communities. Strongly disagrees with statements that identify funding for grizzly bear management as a problem.

View IV   Strongly emphasizes the vulnerability of the grizzly bear population, and is concerned about the status of grizzly bears and increasing human use. Emphasizes the problems of disjointed management between agencies and insufficient funding to implement what needs to be done for bear management.

Solutions

View A   Make conservation, ecological integrity, and grizzly bears a higher priority in Banff National Park and in provincial lands adjacent to the park. Put limits on human use and development, and improve coordination among the agencies responsible for bears.

View B   Don't further restrict human use, as human use has already been restricted in the areas that are most important for bears. Conservation and ecological integrity should be given higher priority in park management. View B is also concerned about decision making processes, recommending that interests be more effectively included in decision making and that science be used to guide policy decisions and management actions. There is a need for better coordination among agencies.

View C   Actively manage bear habitat. This includes creating bear habitat in backcountry areas, reducing bear habitat near communities, developing specific objectives for each habitat area, and opening new areas for recreation when other areas are closed to protect bears. Use less invasive methods for studying bears.

IPS Workshop # 1: Standpoint Clarification (*Who we are and why we don't agree*)

All of the participants in the Q study were invited to take part in the IPS workshops, together with several other key individuals involved directly or indirectly with grizzly bear policy in the region. Attendance ranged from 18-22 people at each workshop, and this included a range of interests similar to those represented in the Q study. A professional facilitator (Felicity Edwards of the CSE Group) co-organized the workshops and led discussions, and all of the authors of this paper participated.

The invitation and agenda for the workshops included the following explanation and information about goals:

> A series of three workshops are being planned over the next year as follow-up to the commitment Parks Canada made last fall for more dialogue about grizzly bear conservation and management. The workshops are built around an Interdisciplinary Problem Solving framework.
> ….
>
> You are being asked to participate in these interdisciplinary problem solving (IPS) workshops to work towards achieving a greater consensus in grizzly bear management. The workshops you are being asked to attend are seeking more than "input." They are designed to think more effectively and efficiently about grizzly bears in Banff National Park. They need the participants to do three things while remaining clear about their own specific views (or standpoint): a) Problem orientation by asking specific questions about the issue; b) Social process – to answer questions about the political and administrative context; and c) Decision process – focuses on what to do about the issue as it has been defined.

The initial workshop began in the early afternoon, and the first half-day was devoted to introductions followed by presentations about IPS and the policy sciences framework. The first presentation reviewed the perspectives revealed in the Q study. This was followed by two presentations on IPS, covering the following:

- a brief discussion of the nature of IPS and how IPS differs from other approaches;
- a review of several cases where the IPS method has been previously applied to other conservation problems in North America and elsewhere in the world;
- an introduction to the need for contextual, problem oriented, multi-method inquiry;
- an overview of each of the major categories of the policy sciences framework.
-

We recommended *The Policy Process: A Practical Guide for Natural Resource Professionals* (Clark 2002) as a source for further information on the framework. We ended the afternoon by informing participants that the next day they would work on clarifying their own standpoints by creating a "mind map" of their views and values, and taking part in a group discussion of the different perspectives involved.

The entire second day was devoted to the mind mapping exercise. Mind mapping is a technique commonly used to generate and organize thoughts in a comprehensive way (Buzan

1991). We asked participants to map their personal views about grizzly bear management, and particularly to think about their standpoints on the problems of bear management, and the values they sought from the process (using the eight value categories of the IPS framework). Each participant worked independently on a mind map, starting with a large poster-sized blank sheet of paper and a marking pen, and, beginning in the center of the sheet, noting down their thoughts about grizzly bear management in Banff and the surrounding region. As the central entries stimulated additional ideas they worked outwards on the sheet, filling in around the central entries, and drawing lines to connect related ideas with each other. Further ideas were then filled in and connected to the initial themes, and the process was repeated until the page was filled. After all the mind maps were complete, each participant presented and discussed his or her mind map with the group.

Although some participants used this opportunity strategically to advocate for particular beliefs about trends and conditions for bear management or human use, other mind maps were highly self-reflective, revealing a good understanding of personal identifications and desires, and a willingness to be open about perspectives with the group.

Workshop #2: Problem Orientation (*What is the "problem" so that it can be usefully defined and solved?*)

In preparation for the second workshop we sent the participants additional reading materials on problem definition (Wallace and Clark 1999), and three information sheets about the IPS workshops: 1) a summary of views expressed at the first workshop; 2) an explanation of the connections between the first workshop on standpoint clarification and the two IPS workshops to follow (included here as Appendix A); and 3) a table outlining the differences between consultation and collaborative decision making.

The Agenda distributed prior to the second workshop included the following explanation:

> This is the second of three interdisciplinary problem solving (IPS) workshops to work towards achieving a greater consensus in grizzly bear management. At the end of the workshops, we should have greater understanding of ourselves and other people involved in this important issue and perhaps agreement on what the actual "problem" at hand really is and what we should do about it in practical terms. . . .

> The first workshop was an exercise in standpoint clarification showing that each of us differs in personality, the way we think, and what outcomes we want. The "mind mapping" exercise and discussion [were] revealing. As a consequence, we saw that each of us sees the grizzly bear issue from a different vantage point given our different identities and the values that we expect and demand. We need to become sensitive to how these different world views will continue to play themselves out as we go into problem orientation in this workshop. We want to move beyond where we were when each of us came into our discussion on day one in the last workshop. If at all possible, we want to move towards creating strategies that encompass our differing value demands by finding common ground. This requires that both leadership and citizens better understand the value dynamics at the heart of grizzly bear management and how

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the present social process is playing itself out. We want to move beyond being just ordinary participants to become active leaders as we gain greater insight into ourselves and how the management process is set up and operates. We want to be in position to direct the process responsibly, not just be carried along by it.

In the five months that elapsed between the first and second workshops, several significant events occurred that influenced the context for grizzly bear policy in the Banff region. One key event was the release of the final report from the Eastern Slopes Grizzly Bear Project's 11 year scientific study of grizzly bears in the Central Rockies Ecosystem (Herrero 2005). Although much of the important information in this study had been incrementally published during the years leading up to the final report (e.g., Gibeau et al. 2001; Gibeau 2000), the release of the final report gave participants for the first time the full study on "reproduction, mortality, and population dynamics of grizzly bears, and factors that influenced these variables" (Herrero 2005: vi). The final report confirms the need for precaution, but does not conclusively point the way for policy makers. For example, the report on grizzly bear demographics in and around Banff National Park and the adjoining Kananaskis Country for the period 1994-2002 concludes that "although this is the slowest reproducing grizzly bear population yet studied, high rates of survival seem to have enabled positive population growth ($\lambda = 1.04$, 95% CI = 0.99-1 .09)" (Garshelis, Gibeau and Herrero 2005a, p. 26). In other words, the statistical estimate of the population growth rate is slightly positive, but a negative growth rate is within the margins of error of the estimate. The authors of the study monitored a smaller sample of bears for two years after completion of the main project (2003-2004) and the results suggest that the survival rates for female bears during those years were lower than during the initial nine year study period. This prompted publication of a postscript emphasizing the importance of stochastic events for survival of this population and the need for ongoing monitoring (Garshelis, Gibeau and Herrero 2005b).

The other significant events that took place between the first and second workshops involved bear-human conflicts. First, as mentioned earlier, a jogger was killed in June 2005 by a male grizzly bear on a trail in Canmore (just outside of Banff National Park). The bear was subsequently shot by a provincial wildlife officer. Second, a female grizzly was killed by a train in Banff National Park, orphaning her 3 cubs. Two of the cubs were killed a few weeks later by vehicles on the transcontinental highway that passes through the park, and the surviving cub was removed from the wild to a nearby bear refuge. These incidents heightened tension about bears, bear-human conflicts and bear conservation. Accordingly, we began the second workshop with a presentation from a senior official at Parks Canada about these events and the agency's responses. The official also discussed how the IPS workshops fit with the agency's ongoing decision-making process for grizzly bear conservation. At the first IPS workshop participants raised questions about why Parks Canada was undertaking this new process and what the agency would do with the results. The agency confirmed its commitment not only to consult stakeholders about grizzly bear management but to open up its decision making to allow more meaningful participation.

Following the Parks Canada presentation, the group turned to the tasks of problem orientation: (i) clarifying goals; (ii) describing trends; (iii) analyzing conditions; (iv) making projections; (v) and inventing, evaluating and selecting alternatives. In order to demonstrate how people often selectively attend to some of these tasks without systematically dealing with

all of them, we chose statements from the initial Q study that were ranked highly by one or more views, and classified each statement according to: (i) the problem orientation task(s) that it addressed; and (ii) whether it identified a problem with "decision process," "social process," or "grizzly bears and their habitat." For example, the statement "There is not enough funding to implement what we know needs to be done for grizzly bear management" was classified as a statement about conditions in the decision process. This exercise provided context-specific examples of the tasks of problem orientation, and also reemphasized that many of the concerns of participants were about social process and the functioning of decision processes rather than simply about bears and science.

We followed this analysis of the Q statements with a presentation on "Problem Orientation: What does it take for a strategy to be reasonable, practical, and justified?" Then we divided the workshop into smaller groups of three or four individuals and asked these groups to spend the rest of the workshop addressing two rounds of questions related to the first four tasks of problem orientation, using as a guide the chart reproduced here as Table 3. The fifth task of problem orientation (developing alternatives) was left for the final workshop.

Table 3. Matrix showing problem orientation tasks and features of the problem context

	Goals (with indices) small groups	What's happening? ⟶	Why? 	Future? large	Does a problem exist? group	Solutions/alternatives (workshop #3)
Social Processes	?	?	?	?	?	?
Decision Processes	?	?	?	?	?	?
Environment/Grizzly Bear Habitat	?	?	?	?	?	?

For each round of questions, the groups began by working independently, then presented their findings to the workshop as a whole, followed by a roundtable discussion. The two rounds of questions are set out below:

Questions for Round 1:
1) What are the goals for grizzly bear management in each of the three categories:
    i) Social process – ideally how would you like people to get along? (civility, use of democratic processes, etc.)
    ii) Decision-making process – who makes the decision?
    iii) Environment and habitat – how do you want it to look on the landscape?
2) For each of these - what might be some of the indices?

Questions for Round 2:
1) Are we moving towards or away from our stated goals? What's happening now, and why is it happening? What does the future look like?
   i) Social process – in terms of our interactions
   ii) Decision process – what decisions are made and how they are made
   iii) Environment and habitat – the number of bears and the nature of the habitat

To give an indication of the general nature of the discussions, Table 4 summarizes the goals and indices identified by the groups in Round 1.

Table 4. Goals and indices for grizzly bear policy making identified in the second IPS workshop

	Goals	**Indices**
Social Processes	a. comprehensive	Inclusive Informed Civil Respectful Honest Ecosystem – wide Flexibility Trust
	b. commitment	Both at the table as well as away from it Time Process Being informed Commitment to working out common interest Longevity of solution Commitment to finding a solution
	c. shared expectations	Recognition of common goal/issue No participant is surprised Outside the table also
Decision process	a. co-creation	Decision is supported by wide cross section Collaborative Responsive to minority input Continued support
	b. effective outcome	Decision is reached and implemented If too premature – say so, retreat and come back again later Clear line of accountability Termination – which indices to use?

	c. identify and respond to reliable knowledge	Ensure an adaptable process of decision making that takes into account emerging knowledge
	d. empowerment of decision making group	Empowerment from selves and from external sources
	e. rules of engagement are clear	Who is at the table What is the legislative framework One size may not fit all – made in Banff process jointly determined Modes of decision making known by all
Grizzly bears/nature/habitat	a. sustainable number of bears on the wider landscape (not just Banff National Park) (note to see Banff National Park management plan goal)	Research to measure population and habitat trends Non-declining population Long term perspective (how long is long term?) Viable population (what is the definition of viable?)
	b. humans on the landscape	Informed humans Accurate information disseminated

By the end of the second workshop, some participants were publicly expressing support for the IPS process. A newspaper article in the local *Banff Crag & Canyon*, entitled "Grizzly workshop breeds optimism: Stakeholders see possibilities for greater co-operation on management of keystone species" (Husdal 2005), included the following quotes from workshop participants:

> "I think the spirit of listening and identifying some mutual goals around the table has been quite impressive. . . . We're basically working on a decision-making model for policy."

> "The animals don't know the boundaries. If we were to make policies that were boundary-based, it really wouldn't be as effective. . . This workshop was definitely one of the community success stories of the year."

> "I think it was very productive. . . There was lots of talk around the issues, but more in relation to what's a better way of working together – what's a better way of coming together to solve these problems."

However, not everyone was willing to give the IPS process a positive endorsement at this point:

> "Not enough has happened to elicit a comment from me yet. It's a process and I'm willing to let it unfold."

Workshop #3 Decision Process (*What would a good decision-making process for grizzly bear management look like?*)

The third IPS workshop focused on the processes of decision making for grizzly bear management. After a review of the previous workshops, we began with a presentation on the functions of decision making and the standards for each function described in the policy sciences literature (Clark 2002; Lasswell 1970). This was followed by a presentation and group discussion about the differences between interest-based and position-based approaches to negotiation and decision making, appropriate principles of interest-based decision making, and how those principles might apply to the IPS group (see, for example, Wondolleck and Yaffee 2000; National Round Table on the Environment and the Economy 1993; Fisher and Yuri 1983). The group then discussed the rules by which their own decision making should be conducted.

After this initial discussion, we divided the workshop into two smaller groups and each sub-group tackled the same test case: the problem of managing human-bear conflicts in the areas of Banff National Park known as Bryant Creek/Allenby Pass and Aylmer Pass. Bryant Creek is important bear habitat, especially in the late summer during berry season when grizzlies commonly feed there, including females with cubs. Bryant Creek is in one of three "core reproductive areas" for grizzly bears identified in the Management Plan for Banff National Park (Parks Canada 2004). Hiking trails through the Bryant Creek area lead to Allenby Pass, a popular recreational destination. Aylmer Pass is also a popular hiking destination and is next to another core reproductive area for grizzlies. The combination of hikers and high densities of female bears with cubs in these areas has led to predictable but unfortunate results. In the period from 1998 to 2005 there were four bear attacks in the Bryant Creek/Allenby Pass area and one attack in the Alymer Pass area.

A Parks Canada manager set the context for the IPS analysis of the Bryant Creek/Allenby Pass and Aylmer Pass problems by explaining the history of the areas and the alternative strategies the agency was then considering for reducing bear-human conflicts. These alternatives included: 1) cutting back vegetation to increase visibility and reduce the number of berry bushes near hiking trails; 2) providing more information to trail users; 3) re-aligning hiking trails; and 4) permanent closure of trails in the area. We asked the IPS sub-groups to use the policy sciences framework to analyze this problem and make recommendations, following the ground rules for decision making they had discussed earlier. Each sub-group then presented its analysis of the problem to the workshop as a whole.

Table 5 summarizes one sub-group's analysis of this problem, organized according to categories of the policy sciences framework. The actual discussion was more loosely structured than Table 5 suggests, and was not as explicitly organized on the basis of the framework. However, the table accurately reflects the substance of the discussion. As the summary shows, this sub-group oriented to the problem and covered most of the categories of the framework, with the exception of social process, which was largely neglected – this may be because the focus of the third workshop was on decision process. The alternatives proposed by this sub-group included strategies to improve decision-making processes as well as preferences about the outcomes of decision making.

Table 5. Summary of the interdisciplinary problem solving exercise conducted for the Bryant Creek/Allenby Pass and Aylmer Pass areas in Banff National Park

Problem Orientation	

Goals	1) What are the underlying goals?
	    - Keep bears and people separate? Is this appropriate?
	    - Avoid legal liability?
	    - Reduce negative interactions and increase positive interactions?

Trends	1) Don't have full information on trends (and alternatives) that went into Parks Canada's proposed strategies 2) Have more information about biological/technical trends and conditions than social and decision-making trends and conditions
Conditions	1) Generally have a good understanding of conditions
Projections	

Alternatives	1) Need to think about long term solutions as well as the solution for this year:
	    - Combine immediate decision with process for reaching longer-term decision
	2) The originally suggested alternatives are not complete and some could be refined:
	    - Some ways of seeing bears are better/safer than others (e.g., horseback vs. hiker)
	    - Are there ways of ensuring that hikers travel in larger groups?
	    - Should we allow some types of users but prohibit others? Based on knowledge or preparedness (bear spray, etc.)?
	3) Consider possible mitigation measures:
	    - Require bear spray?
	    - Require bear training?
	    - Inexperienced users may be open to information/education
	4) May need a comprehensive and effective communication program
	5) Clearly identify trails with a high chance of bear contact
	6) Consider the "no action" alternative
	7) Clearly distinguish the immediate strategy from the future strategy: "This is what we are doing now, but here is where we are going in the future."
	8) Some of the IPS group could choose to become involved over the next few months in working out a strategy for the short term. This could include consultation with others. A larger group could take on the longer-term strategy for this problem.

Decision Process	

Intelligence	1) We have been relying on the opinions of a few self-selected experts about some important information.
	2) We need a broader understanding of where this decision fits in the context of the Park as a whole:
	    - Different rules for different areas (e.g., core areas vs. elsewhere)?
	    - What effects will this decision have on policies in other core areas and elsewhere?
	3) Possibly ask users exit questions about whether they saw bears and their experiences with them (could use for appraisal as well)
	4) Need better information (intelligence) and debate (promotion) about the long-term implications of this decision

	5) Must make the decision for this summer, therefore:
	   - Look at intelligence gaps we have identified and fill in where
	    information is available, then make a decision for the short term
	   - For the longer term, try to fill other intelligence gaps

Promotion	1) Should consider reversibility/irreversibility of alternatives 2) The debate has largely been internal to Parks Canada 3) Perhaps should make a draft decision and then consult with identified groups 4) Consider what implications the decision process used for this problem will have for other settings in the future. Is this the way things will be decided? 5) Need to pay attention to liability and public acceptability
Prescription	1) Assumption has been that Parks Canada should make the decision in order to protect the public. Perhaps the public should make its own decisions about taking the risk or not, with full information?
Invocation	1) Prepare the ground with upper management and politicians as well
Application	

Appraisal	1) How to measure/assess the effects of these decisions?
	   - Maulings may not be the best indicator of success (or failure);
	    Could use encounters, but this is highly variable
	   - "Preparedness of users for bear encounters" may be a better
	    indicator of success
	2) Be more adaptable to year-to-year changes in biological conditions, and use indices of risk?

Termination	1) What will happen if the decision appears to work for several years and then fails? Contingency plan? Alternatives?
Social Process	
Participants	

Perspectives	1) What are people's expectations?
	   - Seeing a bear?
	   - Seeing a bear may be important to the back-country experience.
	   - Some may feel the history of conflict is not so bad.
	   - There is a wide range of expectations and we can't meet them all.
	2) The public doesn't understand how different these bears are from other settings.
	3) The public doesn't understand the liability issue for Parks Canada

Situations	
Base Values	
Strategies	
Outcomes	
Effects	

We closed the third IPS workshop with a review of what had been covered and accomplished at the three workshops and a discussion of where to go from there. The workshop participants agreed to implement the following alternative they had proposed in the IPS exercise for Bryant Creek/Allenby Pass and Aylmer Pass:

> Some of the IPS group could choose to become involved over the next few months in working out a strategy for the short term. This could include consultation with others. A larger group could take on the longer-term strategy for this problem.

Several participants volunteered, with the approval of the larger IPS group, to form a sub-group for this purpose, and that sub-group subsequently met twice. Using the policy sciences framework, they successfully developed a new interim management plan for the Bryant Creek/Allenby Pass and Aylmer Pass areas, which was approved by the larger group and implemented by Parks Canada as a two-year pilot project beginning in the summer of 2006. This new interim plan includes closing the Aylmer Pass trail and a nearby campground from the beginning of berry season in late July until late October. In addition, from early August until late October some trails in the Bryant Creek/Allenby Pass area are closed except to horseback riders, and other trails require special permits for hikers. In order to obtain a permit, hikers must travel in groups of four or more, each individual must carry bear spray, and the group leader must complete a bear-safety orientation. Given the highly contentious nature of this type of management approach in the past, reaching agreement among participants to implement these access restrictions is a very important step forward for grizzly bear conservation in Banff National Park.

The IPS group has continued to meet approximately every three months since the initial workshops to address other problems associated with grizzly bears in the region, in accordance with a list of priorities it has developed. The group recently took on the problem of setting realistic mortality targets for grizzlies in Banff National Park. They brought in an external bear biologist to review the scientific research with them, explain strategies that had been adopted elsewhere, and evaluate the alternatives available in Banff. They eventually agreed that the existing mortality targets for grizzly bears in the park were too onerous, and they recommended a target more consistent with the literature. This recommendation was adopted by Parks Canada and will be incorporated into the next management plan. Other issues that the IPS group has considered include providing security areas for bears within the park, long term monitoring of bear populations, and appropriate levels of human use of a scenic secondary highway between Banff and Lake Louise. The three IPS workshops described here enabled this ongoing dialogue and the group continues to use the policy sciences framework to structure its efforts at collaborative problem solving and participatory decision making.

Discussion

Participatory, collaborative decision making has been widely promoted as a means to overcome intractable conflicts in environmental planning and management (e.g., McLaughlin, Primm and Rutherford 2005; Frame, Gunton and Day 2004; Wondolleck and Yaffee 2000) and in other areas of governance (e.g., Hajer and Wagenaar 2003; Fisher and Yuri 1983). The potential benefits attributed to collaborative processes include finding "win-win" solutions to conflicts, improving relationships and social capital, fostering mutual learning, and generating more broadly supported and implementable outcomes. Collaborative processes that operate at the community level have the added advantage of engaging participants who understand the setting well and often will be affected directly by the decisions made. Brunner et al. (2005) suggest that such community-based decision-making initiatives may represent the beginning of a transition from traditional top-down scientific management to a new form of adaptive governance. As community members demand more say in the decisions that affect them, and evidence of the failures of scientific management continues to mount, community-based collaborative initiatives are an appealing alternative (Cherney and Clark 2008; McLaughlin, Primm and Rutherford 2005).

There is, however, a risk that collaborative decision making may produce "lowest common denominator" decisions, or that the decisions will simply reflect status quo power relationships (Peterson, Peterson and Peterson 2005; Gunton and Day 2003; Pelletier et al. 1999). The fact that a group of diverse stakeholders is able to reach consensus or some other form of collaborative agreement on a particular course of action does not necessarily mean that it is the best course of action. To overcome this risk, collaborative decision making must draw on reliable knowledge from a variety of sources to produce outcomes that are rational, politically practical and morally justified, as well as acceptable to the decision makers themselves.

The policy sciences and collaborative decision making

The IPS workshops in Banff highlight five ways in which the policy sciences framework can help collaborative decision makers to be more rational and effective in dealing with conservation problems. First, the framework encourages comprehensive thinking about the context for problems, thereby increasing the probability that all of the important variables relevant to a proposed solution will be taken into account (Brunner 1991). This includes social and political variables as well as the biophysical variables that are often emphasized in conservation strategies. In Banff, using the framework pushed participants to examine systematically the knowledge with which they were working, to identify what important knowledge was missing, and to assess whether the available knowledge was reliable. The framework also helped participants to understand better the roles that biophysical science and scientists play in decision making. Scientists are important in collaborative processes as providers and evaluators of knowledge, and possibly as participants in decision making, but not as the exclusive decision makers. Science cannot substitute for the necessarily political process of clarifying and securing the common interest (Brunner and Ascher 1992).

Second, by guiding participants sequentially through the five tasks of problem orientation the policy sciences framework helped them to move beyond simply arguing about trends and promoting preferred alternatives. In our experience with many other group decision-making processes, we have observed that discussions often start with a review of troubling symptoms and then jump to a debate about possible solutions. Goals, in particular, are generally assumed and rarely discussed explicitly. The common result of inadequate problem orientation is that solutions are adopted and implemented that do not address the actual problems or the causes of those problems (Wallace and Clark 1999; Weiss 1989; Dery 1984).

The third main way in which the policy sciences framework can contribute to more rational and effective collaborative decision making is by directing participants to consider appropriate goals for social process and decision process, in addition to goals for biological conservation. In the Banff workshops, the discussion of social and decision-making goals led participants to think more deeply about their own underlying interests. Collaboration is more likely to occur when participants abandon traditional position-based bargaining in favor of more meaningful and flexible interest-based negotiation (Frame, Gunton and Day 2004; Wondolleck and Yaffee 2000; Fisher and Ury 1993). A good facilitator can play a crucial role here, by managing the group's own decision-making process and using the framework to guide participants toward interest-based thinking. The facilitator for the IPS workshops had extensive experience with collaborative decision making and dispute resolution. She kept the proceedings on time and on track, helped participants to be self-reflective, and encouraged respectful interactions.

Fourth, the framework asks participants to examine their own standpoints and consider how their identifications and biases shape their thinking. We devoted much of the first IPS workshop to this task (e.g., the mind mapping exercise and the discussion of the results of the Q study). Even so, some participants still appeared to have difficulty making the transition from conventional approaches to grizzly bear policy making (such as lobbying or advocacy), to focus on themselves (standpoint clarification, values). Getting people to see themselves and others in value terms is crucial to clarifying, securing, and sustaining the common interest. It is these values that are at stake and in competition in the decision-making process.

Fifth, by talking explicitly about social process and decision process, it was possible for participants to find ground on which they could agree, even if they could not initially agree on specific policies concerning bears. The invitation for the third IPS workshop reminded participants that they had committed to: i) civility, respect, and democratic discourse; ii) getting and using the best data; iii) evidence-based discussions about people, decisions, and the environment; and iv) working hard and using good judgment to find common ground. Finding agreement on principles such as these built respect and trust across factions in the IPS workshops, while confirming the standards on which the group itself would interact. Discussions of the intelligence and appraisal functions were particularly important, as they raised the issue of appropriate criteria for reliable knowledge. As a result, the group began thinking about what kinds of evidence and arguments they should be willing to accept, and what kinds of evidence and arguments they should reject.

Other lessons from the IPS workshops in Banff

In addition to the benefits of the IPS framework discussed in the preceding section, several other lessons can be drawn from the Banff workshops. These include lessons about the appropriate role of resource management agencies in collaborative decision making, the use of diverse methods, the importance of involving all affected or interested parties, and the need to allow sufficient time for participants to develop skills in interdisciplinary problem solving and collaboration.

The appropriate role of resource management agencies
There is a tension in local collaborative initiatives between the potential benefits of having a powerful government agency acting as organizer and funder, and the desire for community members to have ownership and control of the process. This is particularly problematic in circumstances where the agency involved administers most of the land base under consideration, and has firm constraints and obligations imposed on it from the national level. For the IPS workshops, Parks Canada acted as sponsor and its staff helped with organization, but they did not take a leadership role in the proceedings – this was left to the facilitator and the academics involved. Interestingly, the fact that two of Parks Canada's senior managers in the region committed to attend the workshops appeared to be an important factor in convincing other participants to come. Knowing that senior decision makers were going to be there, others may have felt they could not risk missing the workshops, as decisions might be made without their input or influence if they were not present. Once participants were drawn to the initial workshop, it was possible to build greater interest in and commitment to the IPS process itself.

The presence of senior Parks Canada officials also added credibility to the claim that the agency would not treat the IPS workshops as simply a means of consulting stakeholders. During the first workshop a discussion took place about how the workshops fit with Parks Canada's overall decision-making process. Some participants expressed the belief that this would be just another stakeholder consultation process and that the agency would take the information from the workshops, draft its own amended management plan, and then solicit public comment. Instead, a senior Parks Canada official asserted that the IPS workshops were part of an agency move toward more direct stakeholder involvement in decision making. This surprised some participants and seemed to require a substantial reorientation of their approach. Based on recent meetings of the ongoing IPS group it appears that the reorientation is not complete: on occasion participants still ask Parks Canada representatives to independently develop and propose management strategies to which the group can then respond. Perhaps some members of the group believe that it is safer to follow the traditional pattern of waiting for proposals to come from the agency and then criticizing those proposals, rather than taking on the responsibility of generating strategies and risking the ire of constituents if they fail. However, the adoption by Parks Canada of the interim management plan and other outcomes from the IPS group is evidence that agency representatives are serious in their commitment to give effect to the groups' decisions.

Diversity of methods

Harold Lasswell (1971) characterized the policy sciences as striving for contextuality, problem orientation, and diversity of methods. Diversity of methods is part of the "interdisciplinary" of interdisciplinary problem solving. The IPS workshops used a variety of methods to clarify standpoints, orient to problems, and map social and decision processes. Two of these methods merit particular emphasis: the preliminary Q-method study and the mind mapping exercise. The Q study contributed to progress at the workshops in several ways. First, it allowed participants to relate their views in depth before the workshops began, in a private setting with a receptive listener, and without debate. This reassured participants that their views would be respected, gave them the opportunity to voice hostility privately about other participants and previous management efforts, and developed some trust in the current process and its organizers. Second, the meeting to discuss the preliminary findings of the Q study gathered participants together to talk with each other and the researchers in a relaxed setting, where there was far less at stake than in their typical interactions about bear management. Participants knew that the outcome of this initial meeting would be an academic product rather than a policy decision, and this encouraged them to focus more on enlightenment and less on power. This contributed to respectful interactions, and began to repair relationships and build trust among the group. Finally, the Q study helped participants to clarify their own standpoints and understand better the perspectives of others, turning the early discussion to views and values, which opened up the possibility for more constructive dialogue. To paraphrase the comments of one participant at the Q study workshop "it is becoming clear that this argument isn't really about bears, it's about different views concerning the purpose of national parks."

The apparent success of this Q study in fostering conditions for constructive dialogue in the workshops contrasts with the experiences of Mattson et al. (2006), who conducted a Q workshop with stakeholders involved with large carnivore conservation in the northern Rockies, and with a similar Q workshop held by some of the authors with participants in the Yellowstone to Yukon conservation initiative. In both of those cases the results of the Q study were met with hostile reactions from some participants and the ensuing discussions were more acrimonious. A paper comparing these three Q workshops is in process, but several distinguishing aspects of the Banff Q study stand out as possible factors underlying its relative success. In each of the other workshops the entire Q study took place during 2 days of meetings, including generating the statements, conducting the sorts, and analyzing, presenting and discussing the results. The extended time for the Banff Q study, and the fact that one of the researchers met individually with participants to conduct the Q sorts a few months before the first group meeting, meant that by the time participants met as a group they had already had the opportunity to voice their opinions about the methodology and have their questions answered. In addition, the Banff Q workshop was framed in an open way, as an opportunity to comment on the preliminary results and help the researchers to interpret those results and refine their analysis. As with any small workshop, the unique personalities of the individual participants were also important. A few vocal individuals can shape the tone of a small workshop. Good facilitation can help to manage this dimension, and the Banff study was the only one of these three Q workshops to have a professional facilitator.

The mind mapping exercise also played an important role in developing conditions for successful collaboration in the Banff workshops. It turned the focus inwards at the beginning of the IPS workshops, and reinforced for participants the importance of understanding their

own standpoints and the perspectives of others. This exercise highlighted similarities and differences in the values being demanded by different stakeholders from decision making, and the values being wielded to influence decisions. When participants presented the results of their mind maps to the group, they had the opportunity to talk about their own views again at length, but this time in the presence of other stakeholders. In addition, the novelty of the mind mapping exercise, the Q study, and the overall IPS approach started participants down the road to accepting that this process was something different than the meetings and planning exercises they had attended in the past.

Involving all interested and affected parties

One simple indicator that a decision-making process may be operating in the common interest is that all parties interested in or affected by the decisions are involved or adequately represented (Brunner 2002). For the initial Q study and IPS workshops we relied on our own knowledge of the setting, supported by discussions with stakeholders, to develop a list of possible participants. We then classified those participants according to their affiliations and previously expressed views in order to select a representative set of individuals. We did not ask interest groups to appoint representatives, nor did we ensure that all of those present at the workshops represented particular constituencies or organizations—although many were associated with local interest groups. Our approach to selecting participants reflected tradeoffs among the objectives of designing a collaborative process, keeping the size of the workshops manageable, and providing hands-on skill-building training sessions. Some individuals or groups elected not to participate or to come only to part of the process. For example, local First Nations representatives were invited and a member of a local First Nations community spoke briefly to the group at the first IPS workshop, but otherwise they did not attend or take part. Many factors influence decisions about whether to participate, particularly for First Nations in Canada, but if the actions of agencies develop an expectation that stakeholders will have a meaningful role in decision-making they are more likely to take part.

As the IPS workshops have evolved into the ongoing problem-solving group, occasional issues related to participation and scale have arisen. One way to avoid difficult decisions is to attribute responsibility to outside individuals or groups that may be contributing to problems but that are not part of the process. For example a participant might say, "Why should I agree to sacrifice this activity that is important to me, when I have already given up so much and bears are still being killed elsewhere by . . . who are not taking part or giving up anything." To some extent, this is an issue of scale – the IPS workshops mainly involve participants from Banff and the immediately adjoining areas, but the grizzly bears and some of the causal factors affecting bear conservation in the region extend beyond the national park and beyond the realm of the IPS workshops. In an ideal world, decision-making processes such as the IPS group would take place in multiple locations and would be coordinated and constrained by larger-scale decision-making processes in a hierarchical arrangement (McLaughlin, Primm and Rutherford 2005).

The importance of time and practice

Some people found the policy sciences framework confusing and complex at first, and in some cases even overwhelming. Using the framework effectively is a skill that takes effort to develop and refine, and it is important to give people time, guidance, and the opportunity to practice applying the framework to real problems. In the IPS workshops and other settings where we have taught the policy sciences, we have found that many people take on the framework incrementally, and that different people start in different places. Some start with social process – often with the value categories, perhaps because these categories seem intuitive and can be used to sort out what people want from decisions. Some are drawn to the decision process model, which has been partially incorporated in a variety of modified forms by scholars interested in policy making (e.g., Howlett and Ramesh 2003; Hoberg et al. 2001; Brewer and de Leon 1983). Others find the problem orientation tasks or standpoint clarification particularly interesting or useful. The initial three IPS workshops only provided enough time to introduce the framework, provide some examples, and apply the framework to one test case. More time and practice is needed to develop proficiency and overcome long-established habits. Time is also required to develop trust and allow interest-based collaboration to evolve. Although a substantial allocation of resources may be required to develop such skills, there are large potential rewards in reduced conflict, increased democratic capacity and more effective outcomes.

Conclusion

Maintaining populations of grizzly bears and other large carnivores can be complex and controversial in settings where there is significant human activity (Clark, Rutherford and Casey 2005; Clark and Primm 1996). In the past, policies to protect grizzlies in Banff National Park and the surrounding areas have been hotly contested and the decision-making process has been highly politicized. We believe that the three IPS workshops discussed here were successful in improving communication within the local community, developing skills for interdisciplinary problem solving, building understanding and trust, and beginning the process of improving outcomes for bears and people. Similar conservation problem solving workshops conducted by Clark and others in Wyoming and Australia have had comparable results with the policy sciences framework (e.g., Clark, Begg and Lowe 2002).

For the Banff IPS workshops, the policy sciences framework contributed to success by guiding participants through a comprehensive and systematic analysis of the problems of grizzly bear conservation and the socio-political and ecological context for those problems. This included directing participants to examine their own standpoints and the perspectives of others, attend to the five tasks of problem orientation, and consider appropriate goals for social process and decision process as well as for biological conservation. One key to making progress was that by talking about perspectives, how decisions are made, and how the social process works, rather than arguing about scientific data and the high uncertainty concerning grizzly bears, participants were able to find some common ground—for example, agreeing on standards for a good decision-making process—rather than repeatedly returning to areas on which they disagreed. Using the framework also clearly showed participants that many important aspects of the problem had been frequently left out of the debate. Thus, the use of the policy sciences framework, together with the design of the IPS workshops, promoted many of the process-related factors identified by Ansell and Gash (2007) as particularly important to the success of collaborative efforts, including: trust building; mutual recognition

of interdependence; shared ownership of the process; clear mission; common problem definition; identification of common values; strategic plans; joint fact finding; and small wins. These gains in capacity and problem-solving skills have been accompanied by outcomes from the IPS group that are significant breakthroughs for grizzly bear conservation, including a broadly supported interim management plan for a region that has had frequent bear-human conflicts, and more realistic and defensible targets for bear mortality.

Parks Canada and all of the participants in the Banff IPS workshops should be commended for their courage and openness in taking part in the IPS workshops and experimenting with a different approach to problem solving, and for their commitment to each other and to the process. The IPS group has made substantial progress in dealing with some pressing and controversial issues for grizzly bear conservation in the Banff-Bow Valley. There are, however, difficult challenges that remain to be addressed; not all problems have win-win solutions and at some point participants may have to be willing to give up more significant value indulgences for the common interest. The work of clarifying and securing that common interest continues.

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Appendix A

Making the Connections in the IPS Workshop
This short piece has been written to help make some connections between the first IPS workshop, which focused on standpoint clarification, and the two subsequent workshops on problem definition (focus of workshop 2) and decision making (focus of workshop 3).

First, the mind mapping exercise was an exercise in standpoint clarification. It told us that each of us differs as individuals and because of this we see the grizzly bear issue from different vantage points given our values. Our mind mapping charts that we each talked about to the group revealed some insight into our own and other participants' world views and how each of us sees our selves fitting in to the process of addressing the grizzly bear public policy challenge. We need to become sensitive to how these world views will continue to play themselves out as we get into problem orientation in our next workshop. We want to move beyond where we were when each of us came into our discussion, if at all possible towards creating strategies that encompass our differing value demands. Finding the common interest requires that both leadership and citizens better understand the value dynamics at the heart of grizzly bear management.

Standpoint clarification is just the first step, but it is crucial and the time we spent on it is necessary to dig a little deeper into how the views vary and what underlying differences might be driving them. As you know the Q study confirmed the existence of very different views about both the problems of grizzly bear management and the possible solutions.

In our first workshop, different participants stressed different aspects of problem orientation. People talked about different parts of problem solving in their own way and revealed what values they are most interested in. People usually focus on
the parts of problem solving that they expect will most deprive them in the future of the values they want. In problem solving we need to attend to all the activities of problem solving and all the values at stake through an evidence-based conversation. This will be the focus of our next two workshops.

Second: concerning our values:
Some participants talked about their values explicitly whereas others did not. Perhaps you could now go back and think about the eight values by rereading the one short article handed out on values. Even though all of us are concerned about all eight values all the time, our mind mapping exercise revealed that we rank the importance of values
quite differently, especially when we consider the bear issue.

Third: grizzly bear management involves human social values, people interacting, and decision making and is therefore not easily solved by relying on disciplines (e.g., ecology), local knowledge (e.g., ranchers), agencies (e.g., federal and provincial bureaucracies) or anyone else for resolution. Our job is as a group of thoughtful community members to see if we can discover what a common interest bear management policy would look like. If we can understand our own mind map and values (our standpoint) and those of others, then we can take these into consideration as we try to understand just what the "problem" really is that we are trying to "solve."

Through the IPS workshops we are trying to move beyond the ordinary, everyday understanding of the grizzly bear management issue that dominates most of the present policy debate. If we cannot, we will simply just recycle our own individual outlooks and value demands and leave the workshop in the same place we started. If we can gain a solid understanding of our own standpoint and that of others, then we can better appreciate the true nature of the challenge we all face and possibly find practical options to move forward constructively.

As preparation for the Second workshop (October 27th 1-5 p.m. and October 28th 8:30 – 4:00 p.m.) I would like to ask you to continue to think about your standpoint map and the eight values, not from just an advocacy point of view, but from one wherein you can best assess what you value at base, and how you can contribute to this group of people who see and value things differently than you.